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ppm, indicates that there is a possibility that corrosion exists, but the conventional testing methods have no way to measure the level of iron corrosion.

Referring to FIG. 1, dip test strips 10 having colorimetric reagent 12 disposed thereon are dipped into a sample of brake fluid for one second. The colorimetric reagent is 2,2'-bipyridine. After shaking off excess fluid and waiting approximately 3 minutes, the strips show a red coloration that increases in intensity as the concentration of iron increases.

The colorimetric reagent may further contain an ingredient that reduces trivalent iron to bivalent iron, such as a particular embodiment, the color reaction causes a gradual change from white to red. In one embodiment, the presence of a red color reaction from the colorimetric reagent can be used as an indication of active iron corrosion within the brake system. A bright red color, indicating 300 to 500 ppm iron, is an obvious sign of accelerated active brake system component iron corrosion.

Referring now to FIG. 2, a kit 20 of the invention includes a plurality of substrates (e.g., strips 22 and/or tubes 26) upon or within which colorimetric reagent 24 is disposed. A small sample of brake fluid 28 is dispensed from a dropper onto strip 22 or within tube 26, which may have the colorimetric reagent 24 already disposed within or added separately. Thus, brake fluid sample 28 contacts the colorimetric reagent and may be read manually for color content or with the aid of color testing machines. For example, a strip reading spectrophotometer 30 or tube reading spectrophotometer 32 may be employed to read the resulting color and provide a reading that correlates with the presence of an iron ion in the brake fluid. Of course, the colorimetric reagent may be disposed upon or within materials that are rigid, flexible and of various styles, shapes and sizes.

In certain embodiments, the test strip includes multiple reaction "zones" for different brake fluid tests testing the presence of active corrosive metal. Active corrosive metals can include iron, copper, zinc, or a combination thereof. In another embodiment, the brake fluid iron test may be performed with fluid from anywhere in the vehicle hydraulics system where access to brake fluid is available, such as at the bleeder screws located at each wheel at various anti-lock brakes (ABS) bleeder screw locations. If a high iron level is detected, i.e., 100 ppm or higher, additional testing may be required at various locations in the brake system in an attempt to identify the location of active corrosion.

While the preferred embodiments of the present invention have been illustrated in detail, it should be apparent that modifications and adaptations to those embodiments may occur to one skilled in the art without departing from the scope of the present invention.

What is claimed is:

1. A method for identifying a location of active corrosion in a metal brake component of a brake system through assessing a concentration of iron in brake fluid, comprising the steps of:

(a) providing a colorimetric reagent and a brake fluid sample located nearest to a first brake component at a first location in the brake system;

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(b) contacting said colorimetric reagent with said brake fluid sample, wherein said colorimetric reagent reacts to produce a color indicating the presence of iron in said brake fluid sample, and

(c) observing and comparing said color with a standard indicating an iron concentration of about 100 parts per million or greater, wherein if said color matches said standard indicating an iron level of about 100 parts per million or greater, additional testing is performed on a brake fluid sample located nearest to a second brake component at another second location in the brake system in an attempt to identify a location of active corrosion.

2. The method of claim 1, wherein said colorimetric reagent contains an ingredient that reduces trivalent iron to bivalent iron.

3. The method of claim 1, wherein said colorimetric reagent comprises 2,2'-bipyridine.

4. The method of claim 1, wherein said color varies in intensity with the concentration of iron.

5. The method of claim 1, wherein said colorimetric reagent is affixed to a strip or dipstick.

6. The method of claim 5, wherein the strip or dipstick includes multiple colorimetric reagents for different brake fluid tests, wherein each of said reagents test for the presence of iron, copper, or zinc.

7. The method of claim 1, further comprising the step of analyzing said colorimetric reagent in an electronic color tester in step (b).

8. A method for identifying a location of active corrosion in a metal brake component of a brake system through assessing a concentration of iron in brake fluid, comprising the step of contacting a colorimetric reagent with a brake fluid sample located nearest to a first brake component at a first location in the brake system, wherein said colorimetric reagent reacts to produce a color indicating the presence of iron in said brake fluid sample, and comparing said color with a standard indicating an iron concentration of about 100 parts per million or greater, wherein, if said color matches said standard indicating an iron level of about 100 parts per million or greater, additional testing is performed on a brake fluid sample located nearest to a second brake component at another second location in the brake system in an attempt to identify a location of active corrosion.

9. The method of claim 8, wherein said colorimetric reagent contains an ingredient that reduces trivalent iron to bivalent iron.

10. The method of claim 8, wherein said colorimetric reagent comprises 2,2'-bipyridine.

11. The method of claim 8, wherein said color varies in intensity with the concentration of iron.

12. The method of claim 8, wherein said colorimetric reagent is affixed to a strip or dipstick.

13. The method of claim 12, wherein the strip or dipstick includes multiple colorimetric reagents for different brake fluid tests, wherein each of said reagents test for the presence of iron, copper, or zinc.

14. The method of claim 8, wherein said comparing said color with a standard is performed with an electronic color tester.

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